Claims

1. (Currently Amended) One or more computer-readable media comprising computer-executable instructions for performing a method to calculate concentration of a substance in a test sample, the method comprising:

for at least one observation of a metric for the test sample, finding where on a usable portion of a standard sigmoid curve the observation lies, wherein a first endpoint and an other endpoint of the usable portion of the standard sigmoid curve [[is]] are determined via a second derivative of the standard sigmoid curve, and the usable portion of the standard sigmoid curve comprises a range of a plurality of points between the first endpoint and the other endpoint; and

based on a location of the observation on the standard sigmoid curve, calculating a concentration of the substance.

2. (Original) The one or more computer-readable media of claim 1 wherein the sigmoid curve is represented via a four-parameter formula.

3. (Original) The one or more computer-readable media of claim 1 wherein the standard sigmoid curve represents a sigmoid curve fit to a plurality of observations taken of a reference sample having a known concentration of the substance.

4. (Original) The one or more computer-readable media of claim 1 further comprising computer-executable instructions for performing the following:

determining for at least one observation of a metric for the test sample whether the observation is above a threshold value, wherein the threshold value is determined via a first derivative of the standard sigmoid curve; and

indicating whether the observation is above the threshold value.

5. (Original) The one or more computer-readable media of claim 1 wherein:

the observation indicates optical density for the test sample.

6. (Original) The one or more computer-readable media of claim 5 wherein:

the concentration indicates an amount of antibody in the test sample.

7. (Original) The one or more computer-readable media of claim 6 wherein:

the concentration indicates an amount of anti-PA IgG in the test sample.

8. (Currently Amended) One or more computer-readable media comprising computer-executable instructions for performing a method to calculate concentration of a substance in a test sample, the method comprising:

for a plurality of observations of a metric for the test sample, fitting a test sigmoid curve to the observations; and

calculating a concentration of the substance in the test sample via the test sigmoid curve and a usable portion of a standard curve, wherein the usable portion of the standard sigmoid curve [[is]] comprises a range of a plurality of points, wherein a first edge and a second edge of the range are determined via a second derivative of the standard sigmoid curve~~, and the usable portion of the standard curve comprises a range of a plurality of points~~.

9. (Original) The one or more computer-readable media of claim 8 further comprising computer-executable instructions for performing the following:

indicating the concentration of the substance.

10. (Original) The one or more computer-readable media of claim 8 further comprising computer-executable instructions for performing the following:

displaying the concentration of the substance.

11. (Currently Amended) One or more computer-readable media comprising computer-executable instructions for performing a method to calculate concentration of a substance in a test sample, the method comprising:

finding a usable portion of a sigmoid curve, wherein first and second endpoints of the usable portion of the sigmoid curve [[is]] are determined via a second derivative of the sigmoid curve, and the usable portion of the sigmoid curve comprises a range of a plurality of points between the first and second endpoints; and

calculating a concentration of the substance in the test sample via the usable portion of the sigmoid curve.

12. (Currently Amended) One or more computer-readable media comprising computer-executable instructions for performing a method comprising:

for a plurality of dilutions of a test sample, receiving respective measurements of optical density indicating concentration of live cells within the dilutions;

via the measurements, calculating a concentration of anti-PA IgG for the test sample via a usable portion of a sigmoid curve representing concentrations of live cells within dilutions of a reference sample having a known quantity of anti-PA IgG, wherein the sigmoid curve is represented via a four-parameter logistic technique, and wherein a usable portion of the sigmoid curve [[is]] comprises a range of a plurality of points between two bounds determined via a second derivative of the sigmoid curve~~, and wherein the usable portion of the sigmoid curve comprises a range of a plurality of points~~; and

indicating the concentration of anti-PA IgG for the test sample.

13. (Currently Amended) A computer-implemented method of calculating concentration of a substance in a test sample having an unknown concentration of the substance, the method comprising:

determining a usable portion of a sigmoid curve fit to data points representing observations of a reference sample having a known concentration of the substance, wherein the usable portion of the sigmoid curve comprises a range of a plurality of points representing a range of observational values; and

calculating the concentration of the substance in the test sample based on a subset of observations of the test sample, wherein the subset is within the range of observational values represented by ~~associated with~~ the usable portion of the sigmoid curve.

14. (Original) The method of claim 13 further comprising:

excluding at least one excluded observation of the test sample responsive to determining the excluded observation is outside the usable portion of the sigmoid curve.

15. (Original) The method of claim 13 wherein determining a usable portion of the sigmoid curve comprises calculating a second derivative for the sigmoid curve.

16. (Original) The method of claim 13 wherein determining a usable portion of the sigmoid curve comprises designating a portion between a minimum and a maximum of a second derivative for the sigmoid curve as the usable portion of the sigmoid curve.

17. (Original) The method of claim 13 wherein a point on the sigmoid curve relating to a threshold for a first derivative of the sigmoid curve is used as a lower threshold to indicate presence of the substance.

18. (Currently Amended) A computer-implemented method of determining the concentration of antibody in a blood serum sample, the method comprising:

receiving a measurement indicative of concentration of live cells in a test sample, wherein the test sample is generated by adding the serum to cells and a toxin neutralized by the antibody;

determining whether the measurement ~~concentration of live cells~~ falls within a usable portion of a standard sigmoid curve representing observations taken of a sample having a known concentration of antibody, wherein the usable portion of the standard sigmoid curve comprises a range of a plurality of points representing a range of observations; and

responsive to determining the measurement ~~concentration of live cells~~ falls within the usable portion, calculating a concentration via the standard sigmoid curve.

19. (Currently Amended) One or more computer-readable media having computer-executable instructions for performing ~~the method of claim 18~~ a method of determining the concentration of antibody in a blood serum sample, the method comprising:

receiving a measurement indicative of concentration of live cells in a test sample, wherein the test sample is generated by adding the serum to cells and a toxin neutralized by the antibody;

determining whether the measurement falls within a usable portion of a standard sigmoid curve representing observations taken of a sample having a known concentration of antibody,

wherein the usable portion of the standard sigmoid curve comprises a range of a plurality of points representing a range of observations; and

responsive to determining the measurement falls within the usable portion, calculating a concentration via the standard sigmoid curve.

20. (Original) The method of claim 18 wherein results for plural test samples for plural dilutions of an original test sample are included in the calculating.

21. (Original) The method of claim 18 wherein concentration of live cells is indicated by optical density of the test sample.

22. (Canceled)

23. (Original) The method of claim 18 wherein the antibody is anti-PA IgG.

24. (Original) The method of claim 18 further comprising:

discarding at least one observation having a concentration of live cells outside the usable portion of the standard sigmoid curve.

25. (Original) The method of claim 18 further comprising:

in software, determining the usable portion of the sigmoid curve via a second derivative of the sigmoid curve.

26. (Currently Amended) A software system encoded on one or more computer-readable media, the software system comprising:

a representation of a characteristic sigmoid curve;

means for designating a usable portion of the characteristic sigmoid curve, wherein first and last endpoints of the usable portion of the characteristic sigmoid curve are determined via a second derivative and wherein the usable portion comprises a range of a plurality of points between the first and last endpoints;

means for receiving at least one observation of a test sample;

means for determining whether the observation of the test sample is within the usable portion of the characteristic sigmoid curve; and

means for calculating a concentration for the observation responsive to determining that the observation is within the usable portion of the characteristic sigmoid curve.

27. (Original) The software system of claim 26 wherein the usable portion of the characteristic curve is calculated via a second derivative of the sigmoid curve.

28. (Original) The software system of claim 26 further comprising:

means for determining the usable portion of the sigmoid curve via a second derivative of the sigmoid curve.

29. (Original) The software system of claim 26 further comprising:

means for rejecting an observation responsive to determining that the observation is outside the usable portion of the characteristic sigmoid curve.

30. (Original) One or more computer-readable media comprising computer-executable instructions for performing a method to indicate presence of a substance in a test sample, the method comprising:

for at least one observation of a metric for the test sample, determining whether the observation is higher than a threshold value, wherein the threshold value is determined via a first derivative of a standard sigmoid curve; and

responsive to determining the observation is higher than the threshold value, indicating presence of the substance.